WHAT IS CLAIMED IS:

1. A method of optimizing effects of a shim on adjusting a magnetic field applied to a plurality of cells of a probe, said method comprising the steps of determining values of currents which are applied to a plurality of coils of said shim so that the resonant frequency of each cell of said probe is substantially the same and so that the plurality of cells of said probe are subjected to a uniform magnetic field.

2. The method of claim 1, wherein said values of currents are determined by the following steps:

measuring resonant frequency of each of said cells disposed in said magnetic field without any current being supplied to said plurality of coils of said shim, thereby to obtain G_1, $G_2 \ldots G_M$ wherein M is the number of cells;

measuring resonant frequency of a first cell of said probe using a current I_1 applied to a first shim coil and without any current being applied to the other shim coils, to obtain F_{11} wherein the first subnumber represents the number of probe cell and the second subnumber represents the number of shim coil;

measuring resonant frequency of a second cell with current I_1 being applied to a first shim coil and without any current being applied to the other shim coils, to obtain F_{21};

providing a matrix of factors a_{jk} for resonant frequency of said cells of said probe using the following equation:

$$a_{j1} = \frac{F_{j1} - G_j}{I_1}$$

repeating the above measurements on each cell using a current I_2 applied to a second shim coil and without any current being applied to other shim coils to obtain F_{j2} and using the above relationship to find a_{j2}, continuing this process through all the coils of said shim;

wherein said matrix becomes:

$$A = \begin{bmatrix} a_{11} & a_{12} & \cdots & a_{1N} \\ a_{21} & a_{22} & \cdots & a_{2N} \\ \vdots & \vdots & & \vdots \\ a_{M1} & a_{M2} & \cdots & a_{MN} \end{bmatrix}$$

finally using relationship F = G + AI, find the values of I that gives best fit to a desired resonant frequency of each cell of said probe.

3. The method of claim 2, wherein number of shim coils N is equal to or greater than the number of probe cells M.

4. The method of claim 2, wherein number of shim coils N is less than number of probe cells M, and wherein said matrix is subjected to a least square operation, and the least error is obtained for each cell for the current I being applied to said shim coils to adjust the magnetic field so that each probe cell has the same magnetic field.

5. The method of claim 1, wherein said magnetic field is applied by a magnet in an imaging apparatus, and said plurality of probe cells are disposed within said magnetic field, and said plurality of shim coils are disposed in said magnetic field close to said probe cells.

6. The method of claim 1, wherein said probe cells and said shim coils are provided in a liquid spectroscopy apparatus.

7. The method of claim 2, wherein number of shim coils N is equal to number of probe cells M, wherein currents I are determined using the following equation:

$$I = A^{-1}(F_0 - G)$$

wherein I is a matrix of currents which provides the same resonant frequency F_0 of all said probe cells, and G is resonant frequency of all said probe cells M without any current being supplied to said shim coils N.

8. A method of determining shim coil setting when number of probe cells is greater than number of shim coils, comprising the steps of finding currents required to any desired set of

resonant frequencies of said probe cells using a least square of errors of frequencies from a desired set of resonant frequencies.